

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-42

Name: Fate Dam **County(ies):** Lyman
Legal Description: T106N-R77W-Sec. 25, 36 **GPS:** 43°56'20.38"N 100°00'34.61"W
Location from nearest town: 2 miles east and 2 ½ miles north of Presho

Date of present survey: June 15-17, 2009 (netting); October 21, 2009 (electrofishing)
Date of last survey: June 17-19, 2008 (netting); September 29, 2008 (electrofishing)
Most recent lake management plan: F-21-R-40 (January 1, 2008 to December 31, 2012)
Management classification: Warmwater Semi-permanent

Primary Game Species	Secondary and Other Species
Walleye	Northern Pike
Black Crappie	Yellow Perch
Largemouth Bass	Pumpkinseed Sunfish
Bluegill	Black Bullhead

PHYSICAL DATA

Surface Area: 164 acres **Watershed:** 13,760 acres
Maximum Depth: 19 feet **Mean Depth:** 9 feet
Lake elevation at time of survey (field observations): 3 feet low
Contour map: Yes **Date:** 1992

Ownership of lake and adjacent lakeshore properties:

The majority of Fate Dam is located within a 320 acre Game Production Area that is owned by the Department of Game, Fish and Parks. The upper 1/6th of Fate Dam and the areas of the dam grade and spillway are on private land with easements to the State of South Dakota. Fisheries management activities at Fate Dam are completed by the Wildlife Division of the Game, Fish and Parks Department.

Watershed condition with percentages of land use types:

The watershed of Fate Dam is approximately 13,760 acres or 20.5 square miles primarily located along three creeks to the north and west of the lake. Almost the entire watershed is privately owned agricultural land and grassland. The watershed of Fate Dam is nearly level to gently rolling hills. Soil type is medium to deep clay. Land use is approximately 60% cultivated cropland used mostly for raising small grains, 38% native grasses utilized as pasture or hay land, and 2% farmsteads, tree belts and roads. The immediate shoreline is native grasses and wooded areas. Several small dams are located in the watershed that allows Fate Dam to fill only in years of heavy runoff. These small dams are beneficial in that they act as barriers to help inhibit silt from entering into Fate Dam itself.

Fishing access:

Access is available on the west side of Fate Dam via a good gravel road through the Game Production Area. There is a new (2005) boat ramp located at the end of the access road for access to the lake. There is also ample shoreline for shore fishing opportunities, although shore fishing may be limited during the middle of summer due to dense mats of submergent vegetation.

Condition of all structures (i.e. spillway, boat ramps, level regulators, etc.):

The dam and spillway are in good condition. A new boat ramp was installed in the spring of 2005.

Field observations of aquatic vegetation condition:

Fate Dam contained sago pondweed and floating leaf pondweed around most of the shoreline and especially in the upper 1/3 of the lake to a depth of about 3 feet. The emergent vegetation was mainly cattails with a few bulrushes around nearly 85% of the lake.

CHEMICAL DATA**Field observations of water quality and pollution problems:**

No pollution problems were evident at the time of the survey. Water clarity was good with a secchi disc reading of 3.5 feet. Other water quality characteristics were measured in the field on June 15, 2009, using a HACH water quality kit, an Oyster meter and a YSI 55 meter. Results are found in Table 1.

Presence of a thermocline and depth from surface: No

Station for water chemistry located on attached map: Yes

Table 1. Water chemistry results from Fate Dam, Lyman County, June 15, 2009.

Station	Depth (ft)	Temp (F)	DO (ppm)	CO2 (ppm)	ALK (mg/l)	Hardness (mg/l)	pH	Secchi disc (ft)
A	Surface	67.1	8.90	52.8	173	231	7.46	3.5
A	12	64.2	5.65	47.0	192	245	7.19	

BIOLOGICAL DATA

Methods:

Fate Dam was sampled on June 15-17, 2009, with ten overnight trap net sets. The trap nets have 3ft x 5ft frames, 60ft leads, and ¾ inch knotted mesh. Two experimental gill nets were also set. The gill nets were 150ft x 6ft with 25ft panels of ½, ¾, 1, 1-1/4, 1-1/2, and 2-inch monofilament mesh. On the evening of October 21, 2009, Fate Dam was electrofished for 60 minutes (6-ten minute transects) with pulse DC to sample the largemouth bass population. Conductivity was 830µS/cm with a water temperature of 43°F. Fish indices and statistics were completed using Winfin.

Results and Discussion:

Gill net catch

Table 2. Total catch of two, 150ft experimental gill nets at Fate Dam, Lyman County, June 15-17, 2009.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Yellow Perch	59	92.2	29.5	± 20.0	9.5	56	13	97
Black Crappie	2	3.1	1.0	± 3.1	1.8	--	--	113
Northern Pike	2	3.1	1.0	± 3.1	4.7	--	--	86
Walleye	1	1.6	0.5	± 1.5	3.7	--	--	85

* Six year mean (1974, 1978, 1994, 2003, 2005, 2008)

Trap Net Catch

Table 3. Total catch of ten, overnight ¾-inch frame nets at Fate Dam, Lyman County, June 15-17, 2009.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	41	48.1	4.1	± 1.2	20.5	91	70	101
Black Crappie	22	25.9	2.2	± 1.0	22.5	100	84	86
Northern Pike	12	14.1	1.2	± 0.6	1.2	17	0	76
Yellow Perch	6	7.1	0.6	± 0.6	1.0	--	--	101
Bluegill	2	2.4	0.2	± 0.3	13.0	--	--	128
Largemouth Bass	2	2.4	0.2	± 0.2	0.4	--	--	89

* Eleven year mean (1974, 1978, 1985, 1988, 1991, 1994, 1997, 2000, 2003, 2005, 2008)

Electrofishing Catch

Table 4. Total catch from six ten-minute runs of fall nighttime electrofishing on Fate Dam, Lyman County, October 21, 2009.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Largemouth Bass	4	100	4	± 3.0	33.5	--	--	119

* Five year mean (1994, 2000, 2003, 2005, 2008)

Yellow Perch

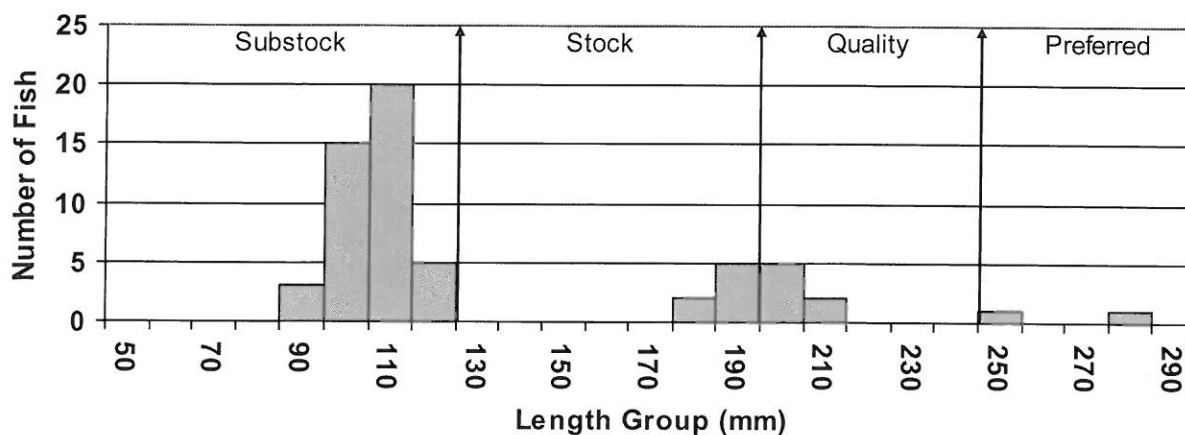
A yellow perch population is on the increase in Fate Dam. The population has been down for a few surveys but now seems to be on the rise. The CPUE for trap nets was 0.6 compared to 0 from the 2006 survey but slightly below the 1.0 eleven year mean (Table 3). The CPUE for gill nets was 29.5 which is well above the 2.0 from 2006 as well as the 9.5 six year mean (Table 2). The age structure for the population is dominated by young fish which was expected (Table 5 and Figure 1). Growth is good with means slightly above statewide, regional and SLI means (Table 5). Condition is also good with a gill net mean Wr of 97.

Table 5. Average back-calculated lengths (mm) for each age class of yellow perch sampled from Fate Dam, Lyman County, 2009.

Year Class	Age	N	Back-calculated Age						
			1	2	3	4	5	6	7
2008	1	43	80						
2007	2	16	94	172					
2006	3	3	94	180	237				
2005	4	1	98	171	244	286			
2002	7	1	73	175	212	248	279	309	326
All Classes		64	88	175	231	267	279	309	326
Statewide Mean			86	145	190	220	242		
Region II Mean			91	152	196	219	242		
SLI* Mean			87	142	185	205	219		

* Small Lakes and Impoundments

Figure 1. Length frequency histogram for yellow perch sampled from Fate Dam, Lyman County, 2009.



Black Crappie

The black crappie population in Fate Dam continues to decline. The CPUE for trap nets is 2.2 which is below the 4.6 from 2006 and well below the 22.5 eleven year mean (Table 3). What is left of the population is dominated by large, older individuals as can be seen in Figure 2. Figures 2-6 illustrate the size distribution of this population over the past five surveys. Growth is good with means slightly above statewide, regional and SLI means (Table 6). Condition for the trap net catch was fine with a mean Wr of 86. The population may see an increase in the next survey as a couple young fish were sampled in this survey as can be seen in Figure 2.

Table 6. Average back-calculated lengths (mm) for each age class of black crappie sampled from Fate Dam, Lyman County, 2009.

Year Class	Age	N	Back-calculated Age								
			1	2	3	4	5	6	7	8	9
2005	4	9	106	199	241	267					
2003	6	2	110	180	211	242	267	294			
2002	7	3	120	174	214	243	266	293	316		
2001	8	4	123	180	221	246	268	287	308	321	
2000	9	1	90	147	190	217	237	262	280	318	332
All Classes		19	110	176	216	243	260	284	301	320	332
Statewide Mean			83	147	195	229	249				
Region II Mean			75	132	177	209	235				
SLI* Mean			78	134	180	209	226				

* Small Lakes and Impoundments

Figure 2. Length frequency histogram for black crappie sampled from Fate Dam, Lyman County, 2009.

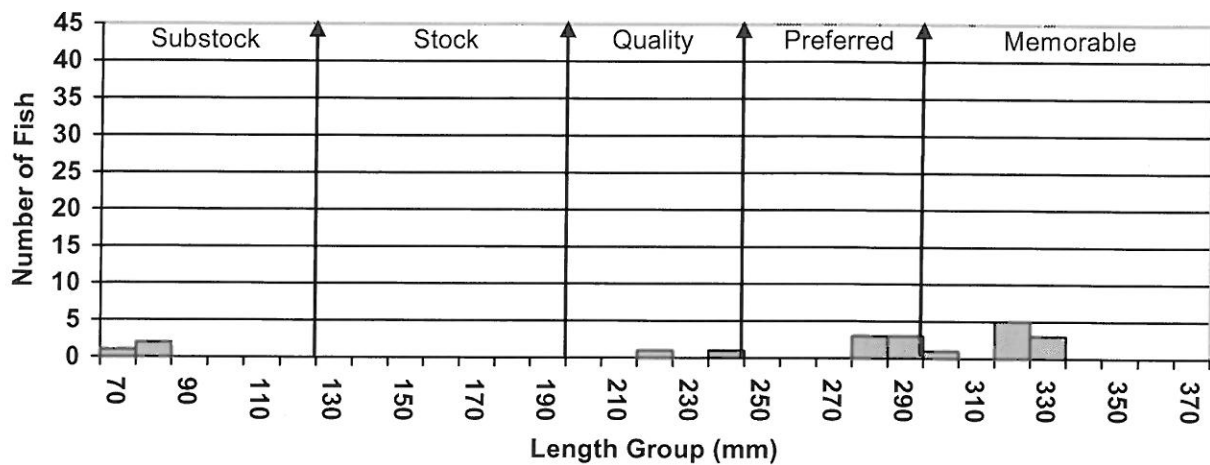


Figure 3. Length frequency histogram for black crappie sampled from Fate Dam, Lyman County, 2008.

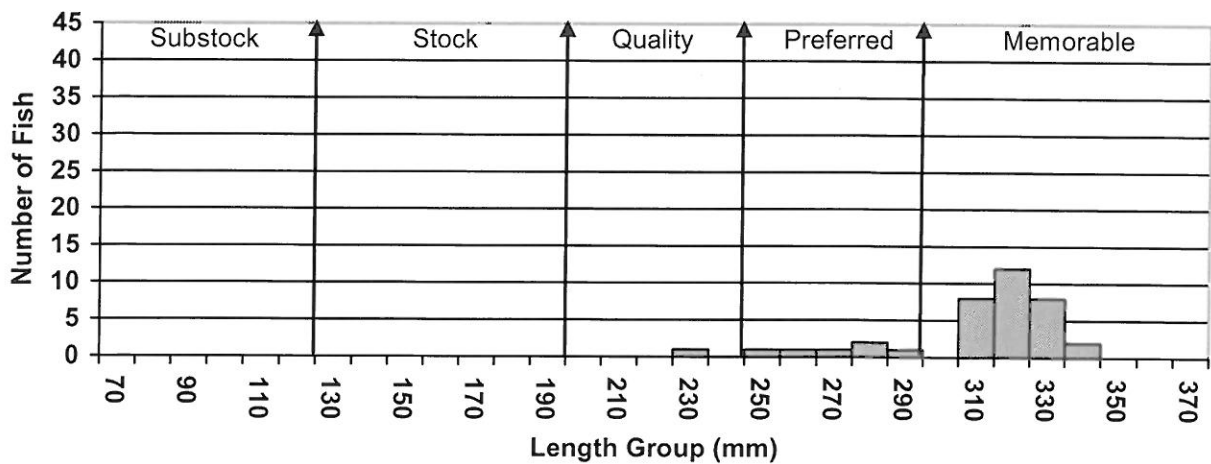


Figure 4. Length frequency histogram for black crappie sampled from Fate Dam, Lyman County, 2005.

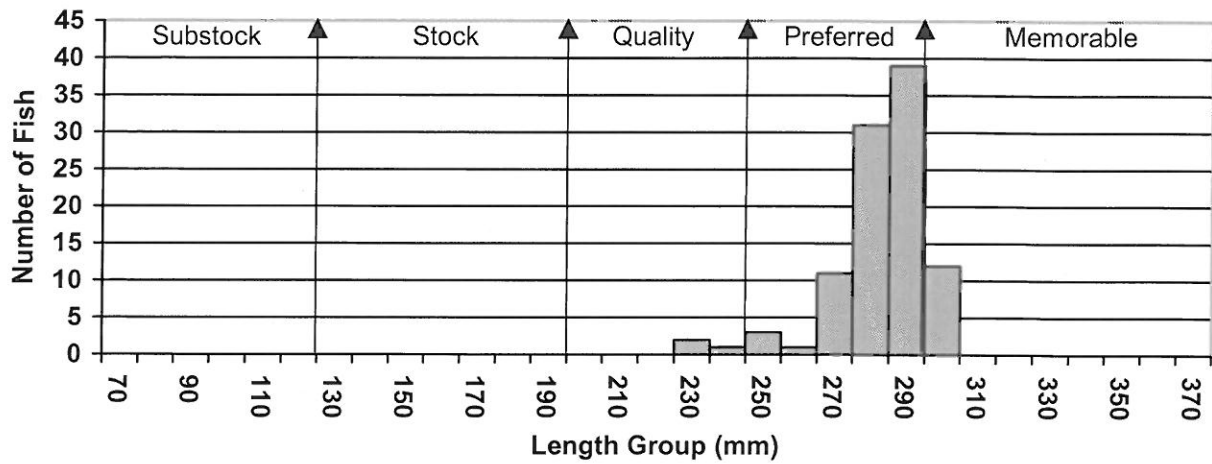


Figure 5. Length frequency histogram for black crappie sampled from Fate Dam, Lyman County, 2003.

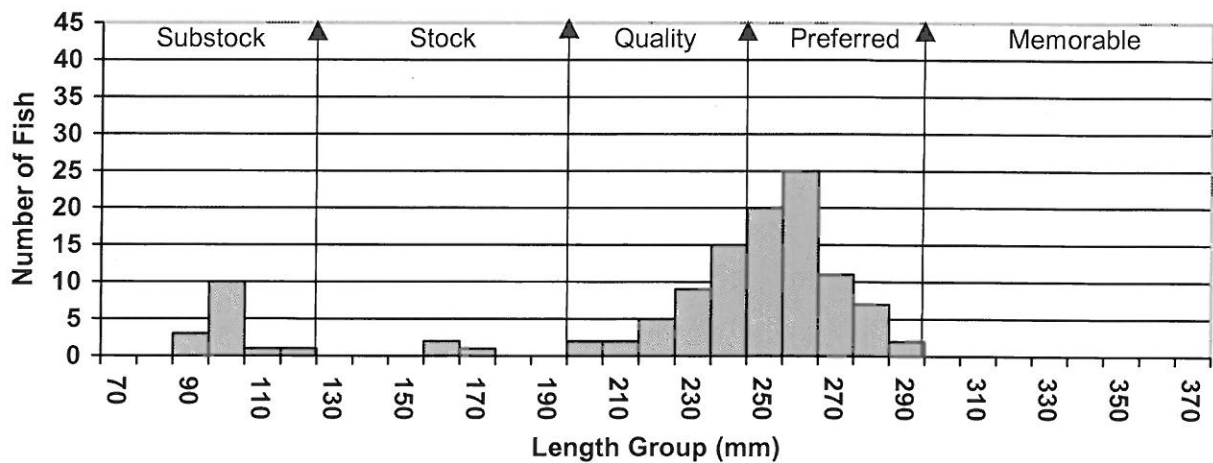
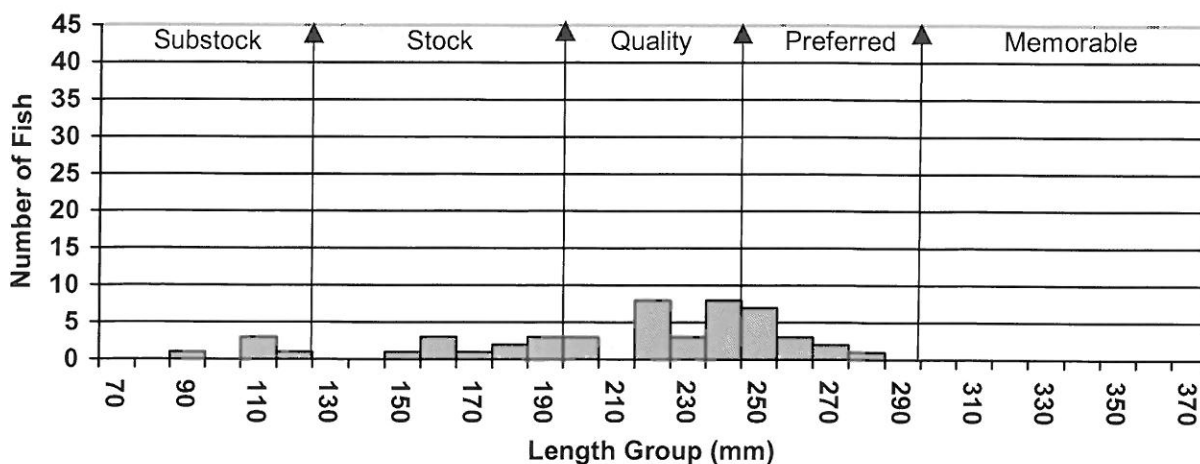


Figure 6. Length frequency histogram for black crappie sampled from Fate Dam, Lyman County, 2000.



Other Species

Largemouth bass, northern pike, walleye, black bullhead, and bluegill were the other species sampled this survey. Green sunfish, pumpkinseed sunfish, and golden shiner were the species not sampled this survey that had been in past surveys (Table 8).

Black bullheads were the only other species sampled this survey in enough numbers to make any inferences about the population. Figure 7 illustrated the size distribution of this population which covers a wide variety of sizes and is not dominated in any one area. The population is showing no signs of stunting or getting out of control at this point. Hopefully things do not change for the worse until we can get our predator populations rebuilt. They are all still low after the severe low water years.

Figure 7. Length frequency histogram for black bullhead sampled from Fate Dam, Lyman County, 2009.

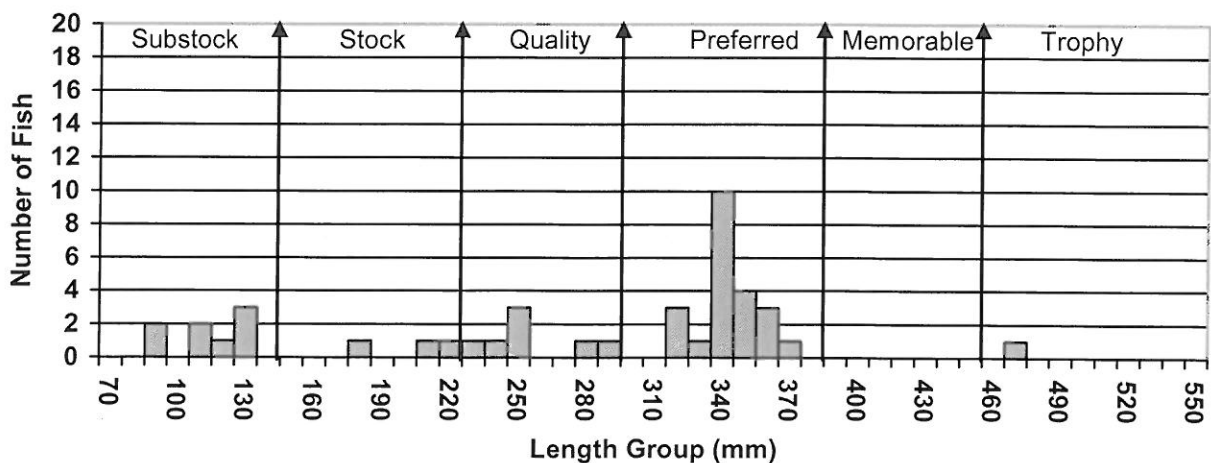


Table 7. Stocking records for the last 10 years for Fate Dam, Lyman County.

Year	Number	Species	Size
1999	4,100	Walleye	Fingerling
2001	6,500	Walleye	Fingerling
2003	4,401	Walleye	Fingerling
2005	2,675	Walleye	Fingerling
2009	15,000	Largemouth Bass	Fingerling

RECOMMENDATIONS

1. Resurvey in 2011 to monitor the fish populations.
2. Stock walleye fingerlings in 2010 to supplement the existing population.
3. Stock juvenile and/or adult largemouth bass to supplement the existing population

Table 8. Gill net (GN), trap net (TN), and electrofishing (EF) CPUE for all fish species sampled in Fate Dam, Lyman County.

Species	1974	1978	1985	1988	1991	1994	1997	2000	2003	2005	2008	2009
BLB (GN)	2.0	--	--	--	--	45.0	--	--	0.5	--	--	--
BLB (TN)	2.2	14.8	99.3	10.0	2.8	46.5	41.0	4.8	2.0	0.6	1.5	4.1
BLC (GN)	1.0	--	--	--	--	8.0	--	--	7.5	--	--	1.0
BLC (TN)	5.5	3.5	12.1	16.9	12.9	50.5	93.1	23.6	12.5	12.6	4.6	2.2
YEP (GN)	2.0	1.0	--	--	--	8.0	--	--	44.0	--	2.0	29.5
YEP (TN)	0.8	0.6	1.0	0.3	0.6	1.6	3.8	1.1	0.6	0.1	--	0.6
LMB (EF)	--	--	--	--	--	94.5	--	14.0	38.0	21.0	0.0	4.0
LMB (GN)	1.0	--	--	--	--	1.0	--	--	--	--	--	--
LMB (TN)	--	0.3	0.9	0.6	0.4	0.4	0.1	--	0.1	0.2	1.8	0.2
NOP (GN)	--	9.0	--	--	--	1.0	--	--	2.5	6.5	9.0	1.0
NOP (TN)	--	2.5	2.3	1.4	1.8	0.3	1.4	1.5	0.8	0.6	0.5	1.2
WAE (EF)	--	--	--	--	--	--	--	3.0	26.0	--	--	--
WAE (GN)	1.5	4.0	--	--	--	--	--	--	4.5	5.0	7.0	1.6
WAE (TN)	--	0.3	2.8	1.3	3.9	1.0	0.5	0.1	1.7	2.7	1.8	--
GSF (GN)	--	--	--	--	--	--	--	--	--	--	--	--
GSF (TN)	--	4.8	--	--	--	--	--	--	--	--	--	0.2
PUS (GN)	--	--	--	--	--	--	--	--	--	--	--	--
PUS (TN)	3.8	--	2.6	2.3	--	5.4	4.4	0.6	1.1	--	--	--
GOS (GN)	--	--	--	--	--	--	--	--	0.5	--	--	--
GOS (TN)	--	--	0.1	--	--	--	--	--	--	--	--	--
BLG (GN)	0.5	--	--	--	--	--	--	--	--	--	--	--
BLG (TN)	9.8	5.4	2.9	6.4	2.9	80.6	15.1	4.8	12.0	1.1	1.8	--

BLB-Black Bullhead, BLC-Black Crappie, YEP-Yellow Perch, LMB-Largemouth Bass, NOP-Northern Pike, WAE-Walleye, GSF-Green Sunfish, PUS-Pumpkinseed Sunfish, GOS-Golden Shiner, BLG-Bluegill